Belarus and Ukraine Thyroid Studies, Ukraine Leukemia Study, and Ukraine Cataract Study

Briefing for

Ambassador Carlos Pascual

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Consequences of the Chernobyl Accident

- April 26, 1986 - Explosion at the Chernobyl Nuclear Power Plant in northern Ukraine
  - Worst nuclear accident
  - 50 tons of radioactive dust dispersed over 140,000 square miles, mainly Belarus, Ukraine, and Russia
  - 4.9 million estimated to have been exposed to radiation

Consequences, Continued

- In addition to the general population, 600,000 - 800,000 Ukrainian liquidators also exposed
  - 300,000 had measurable doses from working on site in hot areas
  - 130,000 Ukrainian liquidators in the Ukrainian State Chernobyl Registry (SCR)
  - 30,000 wore dosimeters

Basis for DOE's Involvement in Chernobyl Health Effects Studies

- In 1988, the United States and the former Soviet Union signed a memorandum of cooperation which led to the establishment of the Joint Coordinating Committee for Civilian Nuclear Reactor Safety (JCCCNRS)
  - U.S. Nuclear Regulatory Commission designated as lead U.S. organization
  - U.S. DOE assigned responsibility for health and environmental effects research (WG 7.0)

Health Studies Conducted Under Auspices of JCCCNRS

- In 1990, DOE began funding health effects studies
- In 1992, DOE signed an Interagency Agreement with the U.S. National Cancer Institute (NCI) to collaborate on 3 studies:
  - Belarus Thyroid Study
  - Ukraine Thyroid Study
  - Ukraine Leukemia Study
- Independently, DOE sponsors:
  - Ukraine Ocular Cataract Study

Belarus and Ukraine Thyroid Studies

- Chernobyl Acute Exposure Characteristics
  - Risk of thyroid disease attributable to I^{131} remains unknown
  - The accident and 10-day fire released 40 to 50 million curies of I^{131} into the atmosphere
  - The plume moved predominately northward and then over western Europe
  - 70% of the radiation deposited over Belarus

Thyroid Studies, Continued

- Early Thyroid Disease Manifestation
  - Since 1987, large increases in the incidence of childhood thyroid cancer in populations of Belarus and Ukraine among those exposed to higher levels of radioiodine
  - The thyroid cancers appear to be more prevalent in those aged 0 to 5 at the time of the accident and in areas determined to be more heavily contaminated with I^{131}

Thyroid Studies, Continued

- Purpose of the thyroid studies is to estimate early and late morphological and functional changes in the thyroid glands
  - 12,000 Belarussians < 19 on 4/26/86
  - 12,000 Ukrainians < 19 on 4/26/86
- All had their thyroids measured for radioactivity following the accident

Thyroid Studies, Continued

- Belarus
- Principal Investigators:
  - Valentin Stezhko, Clinical Research Institute of Radiation Medicine and Endocrinology, Minsk
- Project Started: 5/26/94
- Est. Completion: 4/24
- Time to Completion: 24 years

- Ukraine
- Principal Investigators:
  - Nikolai Tronko, Ph.D., Ukraine Research Institute of Endocrinology and Metabolism, Kiev
- Project Started: 5/10/95
- Est. Completion: 4/25
- Time to Completion: 25 years

Leukemia Study

- Purpose of the leukemia study is to determine the risk of radiogenic myeloid disorders (i.e., leukemia, lymphoma, and multiple myeloma) in a subset of Ukrainian liquidators

Leukemia Study, Continued

- Leukemia Study Principal Investigators:
  - Geoffrey Howe, Ph.D., Columbia University
  - Anatoly Romanenko, M.D., Ukraine Research Center for Radiation Medicine
- Project Started: 10/24/96
- Estimated Completion Date: 2004

Cataract Study

- Project Goal:
  - To determine the incidence of radiation-induced cataracts (posterior subcapsular cataracts or PSCs) as a function of dose in a "dose-defined population," i.e., a subset of the Chernobyl liquidators from the SCR who served from 4/26/86 through 2/28/87

Principal Investigators

- Basil Worgul, Ph.D., Columbia University
  - Overall Study Implementation; Analysis; Questionnaire Scanning
- Yuri Kundiev, M.D., Ph.D., Institute for Occupational Health, Ukraine Academy of Medical Sciences
  - Ophthalmologic exams and questionnaires;
- Vadim Chumak, Ph.D., Ukraine Radiation Protection Institute
  - Dosimetry

Budget/Funding

- Project Started: 8/4/95
- Six-year grant
- Estimated Completion Date: 9/30/02
- The study will enter year 6 of 6 as of October 1, 2000